NOZHA
LANGUAGE SCHOOLS

Ismailia road Branch

Science revision sheet

1st prep.

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Lesson 1 Chemical Combination

- The number of known elements till now is 116.
- They are classified according to their properties and electronic structure into:

1- Metals *2-nonmetals* *3-noble elements.*

- The number of electrons in the outer energy level of an atom indicates its behavior during chemical reaction with other atoms.

Properties of metal:

1. They are solids except mercury which is the only liquid metal.
2. They have luster.
3. They are good conductors of heat and electricity.
4. They are malleable and ductile.
5. They have less than 4 electrons in their outer electrons shells (1, 2 or 3 electrons)
6. During chemical reaction, they tend to lose (grant) electrons to other atoms and become a positive ion that carries positive charges equal to the number of lost electrons.

Properties of nonmetal:

1. Some are solids and others are gases, and there is only one liquid nonmetal which is bromine
2. They have no luster.
3. They are bad conductors of heat and electricity except graphite which is good conductor of electricity.
4. They are not malleable or ductile.
5. They have more than 4 electrons in their outer electron shell (5, 6 or 7 electrons)
6. During chemical reactions, they tend to gain electrons from other atom and become negative ion carry negative charges equal to the number of gained electron
(Metals gain or lose electrons in order to complete their outer electron shell)





The ions

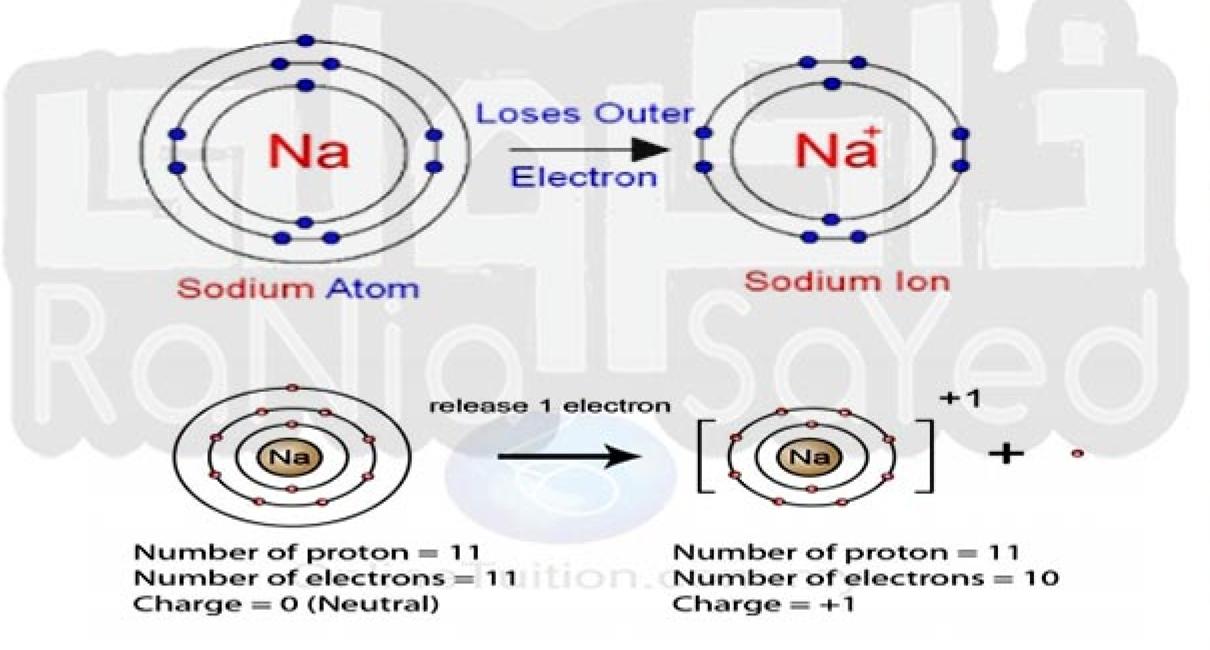
An atom which gains or gives electrons during chemical reaction.



Positive ion

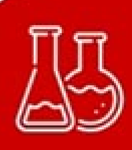
It is an atom which gives an electron or more during chemical reaction.

- The number of electrons in positive ion is less the number of protons inside the nucleus.
- The number of energy level in positive ion is less than its atom.



Negative ion

It is an atom which gains one or more electrons during chemical reaction.

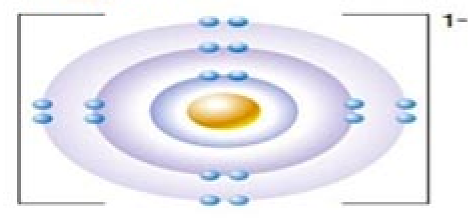




- Chlorine **gains** one electron to become stable
- Results in an ion with a **negative** charge



=



- The number of electrons in negative ion is more than the number of protons inside the nucleus.
- The number of energy level in negative ion equals to that of its atom.

Atom	Ion
1) Electrically neutral 2) The number of electrons equal the number of protons inside nucleus	1) Charged (positive or negative) 2) The number of electrons is less or more than the number of protons inside nucleus

Positive ion	Negative ion
1) It is an atom gives one or more electrons during chemical reaction 2) It carries positive charges equal to the number of lost electrons. 3) The number of electrons is less than the number of positive protons inside the nucleus	1) It is an atom gains one or more electrons during chemical reaction 2) It carries negative charges equal to the number of gained electrons. 3) The number of electrons is more than the number of protons inside the nucleus

Nobel gases

- They are gases.
- They are elements which have completely filled outer electron shells.
- The outer level contains 8 electrons except helium contains 2 electrons.









- They don't share in chemical reaction in ordinary conditions.
- Their molecules consist of single atom.
- They don't form positive or negative ion in ordinary conditions.

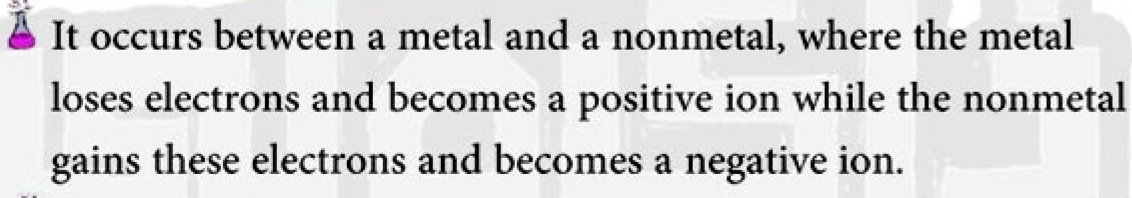
Types of Chemical Bonds

- **Ionic Bonding** – (covered in next chapter) a type of bond in which a metal and a nonmetal **transfer** electrons



- **Covalent Bonding** – type of bond in which 2 or more nonmetal atoms **share** electrons

Ionic bond



- It occurs between a metal and a nonmetal, where the metal loses electrons and becomes a positive ion while the nonmetal gains these electrons and becomes a negative ion.
- As a result a strong electrical attraction takes place between the positive and negative ions forming an ionic compound.

Ionic bond

It is a bond resulting from the electric attraction between a positive ion and a negative ion.

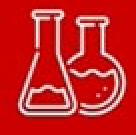


- Formation of sodium chloride compound (NaCl):

$$Na\bullet + \times Cl \longrightarrow [Na]^+ [\bullet Cl]^-$$

electron transer from sodium to chlorine







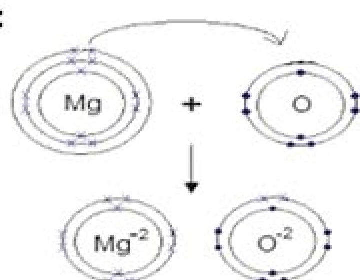


- Sodium atom gives one electron to chlorine atom, as result sodium becomes positive ion and chlorine becomes negative ion and ionic bond is formed between the 2 ions.

Formation of magnesium oxide compound (MgO):

$$Mg + O \longrightarrow [Mg]^{2+}[O]^{2-}$$

two electrons transferred from Mg to O



- Mg atom gives 2 electrons to oxygen atom to complete its outer shell, as result Mg becomes a positive ion and oxygen becomes negative ion and electric attraction takes place between the two ions (ionic bond)

Note

Ionic bond forms compounds only because it occurs between two different atoms (metal & nonmetal).

Covalent bond

- It occurs between two nonmetal atoms, where each atom shares the other with same number of electrons
- No one of the atoms loses or gains electrons, they just share electrons.
- There is no formation of positive or negative ions.
- Covalent bond produces compounds and elements.

Covalent bond

It is a bond between two nonmetal atoms through the participation of each atom with the same number of electron to complete the outer electron shell

Types of covalent bond

a)Single covalent bond

- Each atom shares the other atom with one electron to complete its outer shell.
- It is represented by one line (——) between the bonded atoms.

Example:

Formation of hydrogen molecule ($_1H$)

Hydrogen Hydrogen → Hydrogen Molecule (H_2)

H· H· → H–H

- Each hydrogen atom contains
-One electron in its outer K level
2Hydrogen atoms

-Each atom share the other with
-One electron to complete its K level
Hydrogen molecule (single covalent bond)

Formation of water molecule

-Oxygen atom needs two electrons to complete its outer shell and each hydrogen atom has only one electron and needs only one electron to complete its outer K-level, so oxygen atom shares two hydrogen atoms by two electrons (one for each hydrogen atom to complete its outer K-level)

H H O → H–O–H

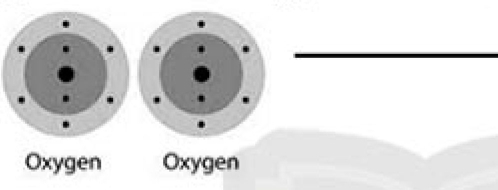
Two single covalent bond.









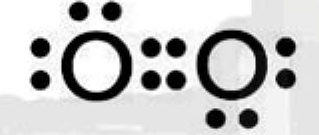


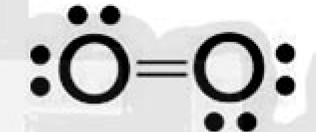
b)Double covalent

-Each atom shares the other atom with two electrons to complete its outer electron shell

-It is represented by two lines (═) between the bonded atoms.

Example: Formation of oxygen molecule.($_8$O: 2,6)





Each oxygen atom contains 6 electrons in its outer L-level

Each atom shares the other with 2 electrons to complete its outer

2 oxygen atoms

oxygen molecule (double covalent bond)

C) Triple covalent bond

-Each atom shares the other atom with three electrons to complete its outer shell.

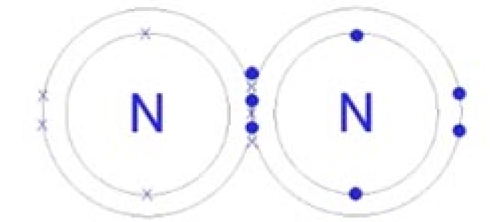
It is represented by three lines (≡) between the bonded atoms.

Example: Formation of nitrogen molecule ($_7$N: 2,5)



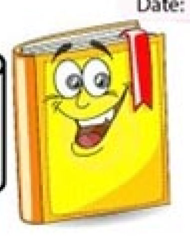
2Nitrogen atom

Nitrogen molecule (triple covalent bond)





Evaluation



1-Complete:

1. The number of the well known elements are …………………..element .
   a. 100 b. 110 c. 116
2. Metals are solids except ………….which is a liquid.
   a. mercury b, magnesium c. sodium
3. ………………..have 1 , 2 , 3 electrons in their outer electron shells .
   a. Metals b. Non metals c. Noble element
4. Non metals are bad conductors of electricity except ………………
   a. Bromine b. Graphite c. Chlorine
5. ……………is an atom gained an electron or more during the chemical reactions .
   a. Positive ion b. Negative ion c. Neutral atom
6. The ionic bond is a strong electrical attraction bond which occurs between ………
   a. positive and negative ions b. negative ions only c. positive ions only

2-If you are given an element (13 Al).calculate:

-he number of electrons of this atom …………………… .

- The number of electrons at the last energy level of the atom is ………………..
- The number of electrons at it's ion ……………
- The number of electrons at the last energy level of its ion …………………

3-Show by drawing the bond between:

- Two oxygen atoms ($_8O$)
- Sodium atom ($_{11}Na$) and chlorine atom ($_{17}Cl$)





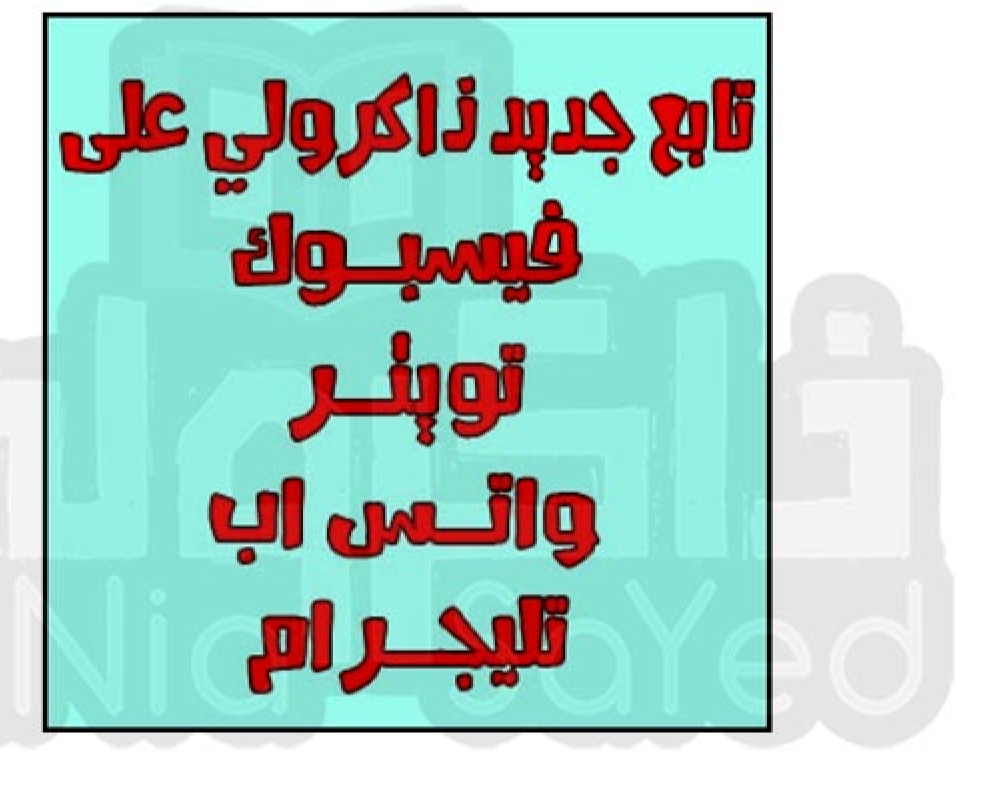




4) Two elements (x and Y)have atomic numbers (8 and 12)respectively :

1- Show by drawing haw the chemical bond is found between them .

2-What is the type of this bond ?









Lesson 2 Chemical compound

Valency :

It is the number of electrons gained, lost or even shared by an atom during chemical reaction.

-The number of electrons in outermost shell of an atom helps to indicate its Valency.

Exercise:

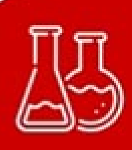
Conclude the valency of the following elements: $_{11}Na$, $_{17}Cl$, $_{8}O$, $_{12}Mg$.

- $_{11}Na$: 2,8,1 loses one electron Na^{+} ⟶ valency 1(monovalent).
- $_{17}Cl$: 2,8,7 gains one electron Cl^{-} ⟶ valency 1(monovalent).
- $_{8}O$: 2,6 gains two electrons O^{-2} ⟶ valency 2(divalent).
- $_{12}Mg$: 2,8,2 loses two electrons Mg^{+2} ⟶ valency 2(divalent)

The following table shows the velancy of some metals

Element	Valency	Element	Valency
Lithium(Li)	1	Magnesium(Mg)	2
Sodium(Na)	1	Mercury(Hg)	2
Silver(Ag)	1	Calcium(Ca)	2
Potassium(K)	1	Lead(Pb)	2
Aluminum(Al)	3	Zinc(Zn)	2
Gold(Au)	3	Copper(Cu)	1 or 2
		Iron(Fe)	2 or 3







The following table shows the velancy of some non metals

Element	Valency	Element	Valency
Fluorine(F)	1	Oxygen(O)	2
Chlorine(Cl)	1	Carbon(C)	4
Bromine(Br)	1	Nitrogen(N)	3 or 5
Iodine(I)	1	Phosphorus(P)	3 or 5
Hydrogen(H)	1	Sulphur(S)	2 or 4 or 6

Atomic group

A set of atoms joined together, behave like one atom, having its own valency and can't exist individually

Atomic group	Symbol	Valency	Atomic group	Symbol	Valency
Hydroxide	OH^-	1	Sulphate	SO_4^{-2}	2
Nitrate	NO_3^-	1	Carbonate	CO_3^{-2}	2
Nitrite	NO_2^-	1			
Bicarbonate	HCO_3^-	1	Phosphate	PO_4^{-3}	3
Ammonium	NH_4^+	1			





Chemical formula

-It is a formula that represents the number and type of atoms in a molecule.

Compound	Chemical formula	NO. of atoms	No. of elements
Water	H_2O	3	2
Sodium carbonate	Na_2CO_3	6	3
Sodium hydroxide	NaOH	2	2
Aluminum Sulphate	$Al_2(SO_4)_3$	17	3

Table shows some chemical formula of some compounds :

How to write a chemical formula?

Write the chemical formula for sodium sulphate.

1. Write the name of compound in words — sodium sulphate
2. Write the symbol of each element or atomic group. — Na SO_4
3. Write the valency down to each symbol. — 1 2
4. Exchange their valency. $Na_2(SO_4)$
5. You don't have to write the number 1
6. Simplify the number of valency if possible.
7. So the formula will be Na_2SO_4

Types of compounds

- There are countless compounds existing in nature
- They can be classified according to their properties into:

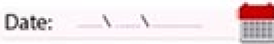
1) Acids 2) Base(alkali) 3) Oxide 4) Salt

Acids

- HCl (hydrochloric acid), H_2SO_4 (sulphuric acid), HNO_3 (nitric acid)
- Compounds which dissociate in water producing positive hydrogen ions (H^+).
- They have sour taste.





- Change the color of litmus paper to red due to presence of hydrogen ions
- Chemical formula starts with hydrogen (H)

H → Joined with nonmetal (HCl, HBr)

H → Joined with negative atomic group except OH^- (H_2SO_4, HNO_3)

2-Base

- NaOH (sodium hydroxide), KOH (potassium hydroxide), $Ca(OH)_2$ (calcium hydroxide)
- Compounds which dissociate in water producing negative hydroxide ions
- They have bitter taste and feel slippery.
- Change the color of litmus paper to blue due to presence of hydroxide ions
- Chemical formula ends with hydroxide (OH).

3-Oxides

- Any element joined with oxygen forms oxide.
- Oxides can be metal or nonmetal.

Oxygen → With metal form metal oxides (Na_2O, Al_2O_3)

Oxygen → With nonmetal form nonmetal oxides (CO_2. SO_3)

4-Salt

- They exist in earth's crust or dissolved in water.
- They are produced from reaction between acid and base.
- Chemical formula A^+B^-





-A^+ can be positive metal ion or positive atomic group

-B^- can be negative nonmetal ion except oxygen or negative atomic group

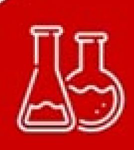
If A^+ is positive metal → With negative nonmetal ion (NaCl)
→ OR with negative atomic group (K_2SO_4)

If A^+ is positive atomic group(NH_4) → With negative nonmetal ion (NH_4Cl)
→ OR with negative atomic group (NH_4SO_4)

Salts are different in some of their characteristics such as colour ,tast and smell

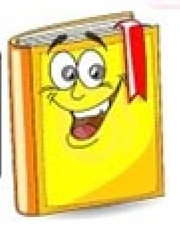
Salts dissolved in water	Salts not dissolved in water
Sodium chloride NaCl	Silver chloride AgCl
Potassium sulphate K_2SO_4	Lead iodide PbI_2
Calcium nitrate $Ca(NO_3)_2$	Lead sulphate $PbSO_4$
Sodium sulphide Na_2S	







Evaluation



1)Complete:

1-The valency of iron is……………..in ferrous chloride, while in ferric chloride is……….……

2-Some non metals have more than one valency as…………, …………….and…………..

3-The difference between nitrate and nitrite group is one……………..atom

4-A compound has a chemical formula XO_2 so the valency of X is…………………..

5-…………………..is example of metal oxide , while……………. is example of non metal oxide.

2)Put (√) or (×):

1. The chemical formula of potassium hydroxide is K(OH) ( )
2. Sulphuric acid consists of 7 atoms from 3 elements . ( )
3. Acids change the colour of litmus to red . ( )
4. Silver chloride doesn't dissolve in water . ( )
5. Al_2O_3 is the chemical formula of Aluminum oxide ( )
6. The number of electrons in the last energy level of magnesium ion is 2 electrons . ( )
7. The type of bond that formed between two atoms by sharing of electrons is known as ionic bond . ( )





3-Choose:

(A)	(B)
1. H_2SO_4	a. turns red litmus into blue
2. NaCl	b. turns blue litmus into red
3. NaOH	c. doesn't affect the litmus paper
	d. turns the blue litmus into red and the red into blue .

4-Write the chemical formula of each of the following:

a- Ammonium chloride

....

b- Aluminum sulphate

....

c- Sodium carbonate

....

d- Iron II (ferrous) oxide :

....

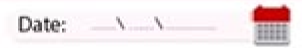
e- Silver nitrate

....











Lesson 3 Chemical reactions & equations

- We can say that a chemical reaction occurred, when you mix two or more substances and you get at least one new substance
- The substances that are mixed together or involved in reaction are called **Reactants;** the new substances produced are called **Products.**
- A chemical reaction is represented by a chemical equation as the following one:

$$2Mg + O_2 \xrightarrow{\Delta} 2MgO$$

Reactants   Product Δ means heat

Chemical equation

It is a set of symbols and chemical formulae that represents the molecules.



Burning of magnesium in presence of oxygen

$$2Mg + O_2 \xrightarrow{\Delta} 2MgO$$

- The heat breaks down the double covalent bond in oxygen molecule
- Now we have two active oxygen atoms.
- Each oxygen atom combines with Mg atom by an ionic bond forming MgO ($Mg^{+2}O^{-2}$)
- So we can see that a bond in reactant molecules has been broken and a new bond is formed in the molecule of product.

Chemical reaction

It is breaking of existing bond in molecule of reactants and forming new bond in molecule of product.



-A chemical equation should be balanced (G.R.F.) because the number of reactant atoms must be equal to the number of product atoms.

Law of constant ratio:

Calculate the mass of reactants and products in the following equation

$$2Mg + O_2 \xrightarrow{\Delta} 2MgO$$

Knowing that mass of magnesium Mg =24, oxygen mass = 16

2Mg	+	O_2 $\xrightarrow{\Delta}$	2MgO
(2 x 24)	+	(2 x 16)	2(24+16)
48	+	32	2 x 40
	80		80

This means that we can get MgO by reaction between Mg and O with any amount but we have to keep the ratio of Mg: O as 3 : 2

Law of constant ratio :

Any compound is produced from chemical combination between the elements of its molecule by constant weight ratio.

Types of chemical reactions:

1-Direct combination reaction :

1) Element with element reaction

$$2Mg + O_2 \xrightarrow{\Delta} 2MgO \text{ (white substance)}$$

$$C + O_2 \xrightarrow{\Delta} CO_2$$

2) Element with compound reaction

$$2CO + O_2 \xrightarrow{\Delta} 2CO_2$$

3) Compound with compound:

$$NH_3 + HCl \xrightarrow{conc.} NH_4Cl \text{ (white fumes)}$$









Chemical reaction in our life

a) We can transform less used substances to more useful substances
b) Used in many industries like fertilizers, medicines, fuel and plastic

But chemical reaction can also have negative effect due to emission of harmful substances which pollute the environment and harm the human.

Negative effects of chemical reaction:

- Carbon dioxide has green house effect (increase the temperature of the earth) G.R.F. because it allows the thermal rays of the sun to pass through but never let them back
- Carbon monoxide (CO) can cause headache, fainting and may lead to death.
- Sulphur oxides like sulphur dioxide (SO_2) and sulphur trioxide (SO_3) ,known as acidic gases and they can harm the respiratory system.
- Nitrogen oxides are formed during lightening, also known as acidic gases. They harm the nervous system
- Burning of coal, plastic and cigarettes causes air pollution and causes cancer.



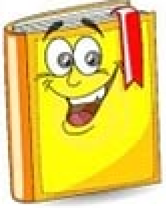






Date: ....\....\.......





1-Write the scientific term

1. It's the process in which bonds in reactants are broken and bonds in resultants are formed . [ ]
2. It's a set of symbols and chemical formula representing the reactants and the products molecules in the chemical reaction and the conditions of the reaction. [ ]
3. The total amount of reactants masses is equal to the total amount of products masses . [ ]
4. Poisonous gases that affect on both the eye and the nervous system . [ ]

2-Give reasons for:

1. Magnesium strip burns in the presence of air .

....

2. A glass rod wet with ammonia solution is exposed to a test tube containing concentrated hydrochloric acid .

....

3-Complete:

1) .... + ... $\xrightarrow{Conc.}$ NHCl type of reaction is (.........................)
2) $C + O_2 \xrightarrow{\Delta}$ .... type of reaction is (.........................)
3) (CO) is dangerous which cause ....,.............and ....
4) Chemical reaction used in many industries such as ....and ....







4-Give reasons for :

1. The chemical equation should be balanced .

....

2-White clouds are formed after the reaction between ammonia and hydrochloric acid.

....

3-A white powder is formed when a magnesium strip burns in air.

....

5-what will happen if:

1- Heating magnesium in air .

....

2- Reaction of ammonia gas and hydrochloric acid .

....



Unit two

Lesson 1 Fundamental Forces in Nature

Any object has two phases:

-Static phase (rest)

-Motion phase (movement)

- Any object is static because there is no force acting on it.
- When you exert proper force on a static object, it changes its phase to motion Ex. hitting a ball with your leg.
- Also when you do force on moving object, it changes its direction of movement.

Force

It is an effect that attempts to change the object's phase from static to motion or vice versa or attempts to change the direction of motion

- Unit of force is Newton.
- If you exert force on object and it doesn't move, this is because the exerted force is improper (not enough to move the object). Ex. pushing a wall by your hand.
- There are many forces in nature and they resulted in some phenomena as:
- Lightening - thunder - wind motion

<u>-Forces can be divided into 3 main types as follows:</u>

Forces
- Attraction force
- Electromagnetic force
- Nuclear force
  - Strong nuclear force
  - Weak nuclear force



first: Attraction force

- All objects are attracted to earth by a force known as **"Weight"**

Objects weight

The ability of earth to attract object to its center

- This force (weight) increases by increasing mass of object.

Weight (Newton) = Mass (kg) x g

-g is gravity acceleration (m/sec^2)

-Mass has a fixed value, while weight changes from one plac Weight to another

-As the distance from earth's center decreases.

the weight increases and vice versa

Object's effective point: (object's center of gravity)

The point at center of object at which the force of gravity affects the object

Second: Electromagnetic force



Electric current has a magnetic effect.

Structure of electromagnet:

Insulated copper wire coiled around a soft iron nail and the two ends of wires connected to battery

The iron bar becomes a magnet that can attract iron filling

Technological application on electromagnetic force:

1) Electromagnet: used in many devices as electric bell and in crane to lift heavy iron blocks

   Idea of working: Change electric energy to magnetic energy

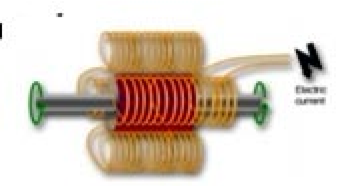



1)Electric generator (dynamo): used to generate electricity

Idea of working: change mechanical energy to electric energy.

2) Electric motor: used in fans and blender

Idea of working: convert electric energy into mechai

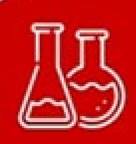


Third: Nuclear force

- The atom stores massive amount of energy inside the nucleus.
- Scientists succeeded to get this nuclear energy out and used it in military and peace
- This massive energy is accompanied by two types of forces:

1) **Weak nuclear force:** used to get radioactive elements and radiation used in medicine, scientific researches and industry
2) **Strong nuclear force:** used to produce electric energy and in military purposes.

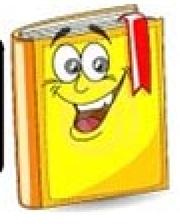
Egypt seeks after using nuclear energy in producing electricity.









1) Choose :

1- A car of mass 500 kg and another of 1500 kg moves with the same acceleration , the acting force of the greater mass …………….that of the car of the smaller mass .

a. equals to b. equals half
c. equals double d. equal three time

2- The unit of measuring the weight is …………

a. m / sec b. Joule c. Newton d. Kg

3- The weight of the body increases as its ………….increase .

a. distance b. charge
c. mass d. square of distance

4- If the mass of an object decreases to its half , so the weight ……………..

a. increases to the double b. decreases to the half
c- still constant d- no correct answer

2) Put (√) or (x) and correct the wrong:

1. When the distance between two bodies is doubled , the gravitational force between them does not change . ( )
2. weight of the body does not change from place to another on the earth's surface while mass of the body changes. ( )
3. The unit of measuring weight is Newton / kg . ( )
4. The atom stores great energy in the electron . ( )
5. Dynamo is used to change electric energy to magnetic energy . ( )
6. Strong nuclear forces are used in generating solar energy . ( )



3) Complete :

1. The mass of the body at the earth's surface is ………….its mass in the moon's surface .
2-……………..increases as we come near to the earth's center .
3. The electric current has ……………….effect .
4. The work done on raising a body distance increases by increasing ………..of the body.
5. The electromagnet is used in some machines such as ……………..and …………
6. The electric generator is used to change ……..…energy to …………energy like ………
7. The motor changes ……………..energy to ………………..energy like …………
8. ……………………is used in Egypt to generate electricity .

4) Give reason for :

1. The change of the weight of the body from place to another while the mass of the body is constant .

………………………………………………………………………………………

2. The gravitational force is more obvious between the celestial bodies .

………………………………………………………………………………………

3. The gravitational force between two masses increases as the distance between them decreases .

………………………………………………………………………………………

4. You have to do work when you lift a ball up .

………………………………………………………………………………………

5) Problems

1. A body of mass 50 Kg at the Earth's surface(acceleration due to gravity = $9.8 m/sec^2$) .

<u>find :</u> a. The weight of the body on the earth .

……………………………………………………………………………..

b. The mass of the body on the moon's surface .

……………………………………………………………………………..

2. Find the mass of a body of weight 300 N. knowing that the gravitational acceleration = $10 m / sec^2$ ……………………………………………………..

………………………………………………………………………………………







6) What happens if :

1) You push a well by your hand .

....

2) The object's mass increases (relative to the object's weight) .

....







Lesson 2 Accompanied forces with motion

Any object can't change its phase (motion or rest) unless an external force acted upon it.

Inertia in our daily life:

1) Vehicle's passengers and driver move forward when the vehicle stops suddenly.
2) Vehicle's passengers and driver move backward when the vehicle starts moving.
3) A football player falls on ground if tripped during running.
4) A coin falls down in a cup when the card is drawn suddenly.

Notes

- Force of inertia affect on objects in motion and at rest.
- Any object inside the car is having the same car speed.
- Inertia is a force that resists change in object's phase.

Technological application on inertia:

Using safety belt in cars (G.R.F.) to stop the force of inertia and the passengers don't get hurt when sudden change in motion occurs.











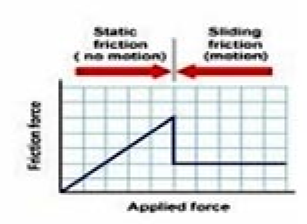
1)Friction force:

Any object in motion is in friction with the surrounding medium (air, ground, ...)

- Friction force resists motion and it acts in direction opposite to motion.







Benefits of friction:

1) It prevents slipping down during walking.
2) Lightening matches
3) It helps to stop and start car's motion (control the car).

Harms of friction:

1) Loss of mechanical energy because it is changed into heat energy.
2) Internal parts of machines get hot causing their expansion and affects performance of machine
3) Erosion and damage of these machine parts.

How to control the friction force?

1) Car tires are covered with rough material to increase friction force and controlling the car.
2) Using oils & lubricants in mechanical machines to decrease friction force.



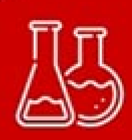


Forces inside living systems:

1) Heart muscle contraction and relaxation helps the heart to pump blood all over the body.
2) Pulse inside blood vessels helps the blood to rise to heart from lower parts.
3) Contraction and relaxation of muscles help the body organs to move.
4) Liquid transport through pores and walls of cells from higher to lower concentration.



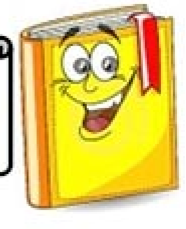












1) Choose :

1. The inertia of the body increases by increasing the body …………..

   a. volume   b. mass   c. displacement   d. density

2. If the net force acting on a body at rest is absent , the body ………….

   a. moves with uniform velocity   b. remains at rest

   c. moves with uniform acceleration   d. moves with non uniform velocity

3. The frictional force acting on a body is ………………to the direction of motion .

   a. opposite   b. in the same direction

   c. parallel   d. perpendicular

4. The centrifugal force acting on a body increase by increasing its ……………….

   a. weight   b. velocity   c. volume   d. distance

5. Part of the mechanical energy is lost as heat energy due to the ………….between the rode and a moving car .

   a. attraction force   b. fractional force

   c. centripetal force   d. magnetic force

4) Give reason for :

1. On the stop of peddling , the bike stops after a short distance .

………………………………………………………………………………………

2. The fall of a metal coin down in a cup when the card is drawn suddenly .

………………………………………………………………………………………

3. It is difficult for the huge trunks to stop suddenly .

………………………………………………………………………………………



4. It is necessary to use the seat belt while driving .

....

5. When a person jumps from the bus , he should run a certain distance .

....

6. Machine must be lubricated from time to time .

....

3) Write scientific term :

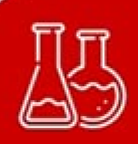
1- An effect attempts to change the object phase from being static to motion or vice versa . [………………..]

2- Materials which are used to reduce friction in mechanical machines . [………………..]

3- It is a property of an object has to resist the change in its phase unless an external force acted on it . [………………..]

4- A force that help in moving and stopping car and bus . [………………..]











Lesson 3 Motion

Motion is the change in object's position as time passes.

Relative motion:

It is the change in object's position or direction as time passes relative to another object or fixed point known as frame of reference.



Examples on relative motion in our life:

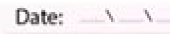
If you are in a moving car and observing other cars moving by your side, you may observe:

- If one car moves by your side with the same speed, you feel that there is no motion (as if the two cars stop moving).
- If one car moves against your direction with the same speed or even lower speed, you feel that the other car moves with high speed in opposite direction.
- If you move beside a stopping car, you feel that this car is moving backward.
  If you stop the car and observe other moving cars, you feel that your car sometimes moves forwar**d and another time moves backward.











Types of motion:

1)Transitional motion:

- The object moves from initial position to final position (end point).
- The object's position changes from time to time relative to a fixed point (frame of reference).

Transitional motion:

It is the motion in which the object's position changes relative to a fixed point from time to time between initial and final positions.

Examples on transitional motion:

Train motion – bike motion – car motion – football player motion

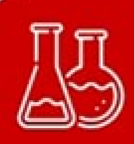
1)Periodic motion:

It is a motion which is regularly repeated in equal periods of time.

Periodic motion

Vibrating motion	Circular motion	Wave motion
Ex. Pendulum's motion	Ex.: motion of fan arms	Ex.: water waves after throwing a stone or rock







Wave motion is divided into two types:

1. Mechanical waves.
2. Electromagnetic waves.

Mechanical waves	Electromagnetic waves
1- Produced due to vibration of medium particles. 2- Needs medium to transfer through. 3- Its speed is relatively low. **Ex.:** Sound wave, water waves	1- Accompanied with electromagnetic force 2- Spread in all material and non-material media (space). 3- Its speed is relatively high. **Ex.:** light waves, wireless waves, radio &TV waves, UV & IR rays of the sun.

Application on wave motion:

1) We see lightening before hearing thunder, although they occur at the same time (G.R.F.)

- Because thunder (sound) is a mechanical wave which has low speed while lightening is an electromagnetic wave which has very high speed.

2) We see the sunlight but we don't hear the sound of solar explosions. (G.R.F.)

- Because light rays are electromagnetic waves which don't need medium to travel through, while sound is mechanical waves which need medium to travel through.

3) Astronauts can't hear each other in space (G.R.F.)

- Because sound is a mechanical wave which needs medium to travel through, so astronauts use wireless communication (electromagnetic waves).

Technological applications for mechanical waves:

1) Examining and curing sets for human body using sound waves (sonar).
2) Stringed musical instruments (Ex.: violin, guitar, lute) and pneumatic musical instrument (Ex.: flute, reed pipe).







3) Amplifiers and sets for distributing and controlling sound used in broadcasting studios.

Technological applications on electromagnetic waves:

1)Infrared ray used in:

a. Night vision apparatus used by military force
b. Cooking food because it has a heat effect.
c. Remote control sets used to operate different machines.
d. Remote instruments to photograph earth's surface using satellites

1) **Ultraviolet rays:** used in sterilizing surgical operation rooms

1)X-rays used in:

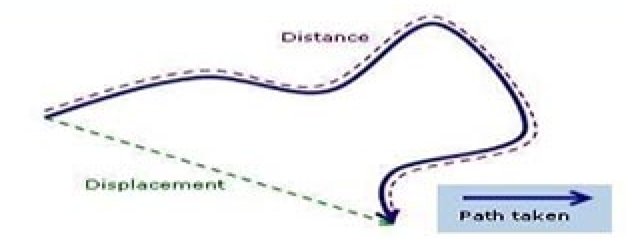
a. Photographing bones and detecting fractures.
b. Examining mineral rows in industry and showing errors, pores and cracks in minerals.

2) **Gamma rays:** used in treatment and discovering some tumors.
3) **Visible (seen) light:** used in photographic cameras, TV camera and data show.

Graphing motion:

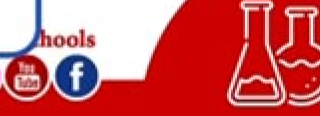
Displacement:

It is the distance moved by an object away from its original position at any moment.



Speed:

It is the distance covered by an object in unit time.





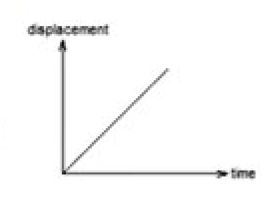




If we graph the displacement / time graphs, we get 3 types of graphs:

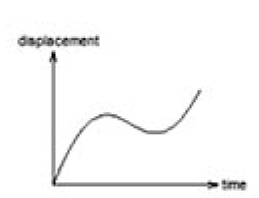
1) **Regular (uniform) speed motion:**

- Displacements occurred every second are equal
- Represented by a straight line passing through original point



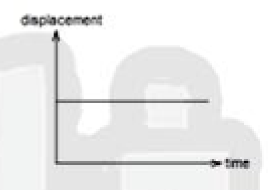
2) **Irregular (non-uniform) speed motion:**

- Displacements occurred every second are not equal
- Represented by a curved line passing through original point.



3) **A static object:**

- Displacement value is constant (doesn't change as time



Regular(Uniform)speed	Irregular (Non uniform)speed	Body at rest.
Represented by a straight line passing through the origin point.	Represented by a curved line passes through the origin point.	Represented by a straight line parallel to the time axis.
Distance (m) / Time (sec)	Distance (m) / Time (sec)	distance (m) / Time (sec)

Evaluation





1-Complete

1- There are two types of motion which are ………………. and ……………….

2-Example of periodic motion ………………. .

2- When an object covers equal ……………at unequal periods of time , so it moves with ………………. speed.

4-……. and ………..are the two basic factors necessary to describe the motion.

3- The speed measuring units are …………………or…………………….

4- The speed of a moving body relative to the observer is ………………speed.

5- The thing that moves with constant speed in the space is ……………………

2-Define :

1- Transitional motion .

2- Periodic motion

3- Relative motion .

4- Speed .

5-Motion.

3-Give reason :

1- Astronauts can't hear each other voices directly in space .

……………………………………………………………………………………………

2-The speed of a moving body increases as the covered distance increases at Constant time.

……………………………………………………………………………………………

3-The train moves at an irregular speed.

……………………………………………………………………………………………

4-The importance of speedometer in cars and planes.

……………………………………………………………………………………………

5-A moving car seems to be at rest relative to the rider of another moving car beside it with the same speed and direction.

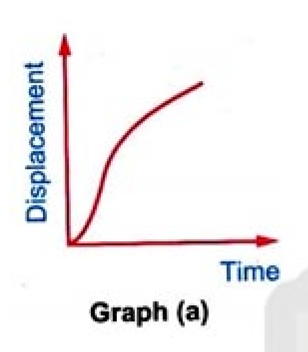
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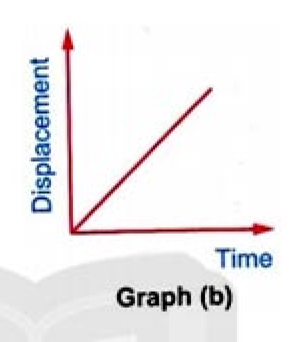




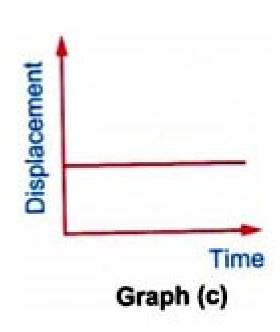
4- Identify the phase of the movable object in each graph of the following :



Graph (a)



Graph (b)



Graph (c)

Solve the following problems

1- A Bus covers a distance of 120 km with speed 90 km/h then it covers 105 km at 70 km/h .Calculate the time needed to cover the whole distance.

....

....

2- Car (A) moves with speed 60 km/h and car (B) moves in the same direction with speed 90 km /h . Find the relative speed of car (B) relative to an observer is :

a- Stand on the ground.

....

b- In car (A).

....

3- Two cars move in straight line , car (A) moves at 20 m/s , while car (B) moves at 25 m/s **Calculate**:

a- The distance covered by each car after one minute

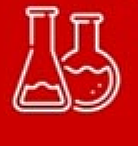
b- The time taken by each car to cover a distance of 100 m.

....

....

4- A runner covers 450 meters in 45 second . find his speed.

....









Lesson 1 Celestial bodies

- Celestial bodies are anything that swims in the space like moons, planets, stars, gaseous bodies, ……..
- Stars are big sized bodies but they appear small because they are very far away from us.
- The distance between stars can't be measured in kilometers, because it's too large to be measured in kilometers. It is measured in light year.
- Celestial bodies are found in groups known as galaxies.

Light year:
It is the distance covered by light in one year, it equals 9.467×10^{12}Km

Galaxy:
Biggest unit in universe which consist of group of millions of stars.

- Our solar system belongs to "Milky Way Galaxy" OR "Way of chopped hay", it has oval shape with coiled arms. The sun lies on one of these arms.

Solar system

- It exists in Milky Way Galaxy.
- It consists of sun, eight planets revolving around the sun, moons, asteroids. Meteors , meteorites and comets.
- The biggest object in solar system is the sun.

Planets:

(Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune)

- Eight spherical opaque objects revolve around the sun in elliptical (oval) paths
- They revolve in one direction (anticlockwise).








- Their paths lie on one plane perpendicular to the sun's axis of rotation around itself.
- Based on the distance from the sun, they are divided into two groups: Inner and Outer planets.

	Inner planets	Outer planets
Planets names	Mercury, Venus, Earth, Mars	Jupiter, Saturn, Uranus, Neptune
Distance from sun	Nearer to the sun	Farther from the sun
Composition	Solid surface (rocky)	Gaseous element mainly hydrogen and helium
Size	Small	Huge (big sized)
Density	High (3.3 to 5.5 g/cm^3)	Low (0.7 to 1.3 g/ cm^3) because they consist of gaseous elements

- All the inner planets have atmosphere except Mercury.
- Outer planets are characterized by presence of large number of moons.
- Hydrogen gas is found in solidified state in outer planets due to the high pressure and extreme cold on these planets.

Moons:

- Small planets rotate around larger planets by the effect of gravity.
- Considered as satellites of the planets.

Planet	No. of moons	Planets	No of moons
Mercury	No moons	Jupiter	62
Venus	No moons	Saturn	60
Earth	1	Uranus	27
Mars	2	Neptune	12





Asteroids:

- Different sized rocky masses rotate between orbits of Mars and Jupiter forming "Wonderer asteroid belt"
- This belt separates inner and outer planets.

Meteors:

- Small rocky masses that fall within the atmosphere.
- They burn completely due to heat produced during friction with air.
- They appear like luminous arrows can be seen by naked eyes.

Meteorites:

- Huge solid rocky mass. that fall within atmosphere.
- They don't burn completely, parts of them reach to |Earth's surface
- The biggest meteorite has 80 tons mass and exists at southern west Africa.

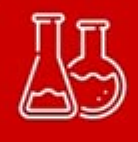
Comets:

- Masses of ice, rocks, solidified gases rotate around the sun in more elongated elliptical orbits intersecting with the planet's orbits.
- A comet consists of two main parts:
  a) Head: contains ice, mixture of solidified gases (oxygen, nitrogen, methane), rocky parts, dust and water molecules.
  b) Tail: Gaseous cloud
- The most famous comet is Halley (seen in 1986), it completes one rotation around the sun every 76 years.

Difference of gravity force on planets surface

- Isaac Newton proved that there is force of gravity between any two objects in space.
- This force of gravity depends on 2 factors:











a) Mass of the two objects.
b) Distance between them.

- Planets in the solar system revolve around the sun by the effect of the sun's gravity.
- The gravity differs from one planet to another.

Planet	Gravity acceleration	Planet	Gravity acceleration
Mercury	3.78	Jupiter	22.88 (largest gravity)
Venus	8.6	Saturn	9.05
Earth	9.78	Uranus	7.77
Mars	3.78 (least gravity)	Neptune	11

Telescope

-Used to identify celestial bodies.
-The most important types are:

Reflecting telescope

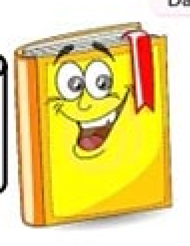


Refracting telescope



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Evaluation

1- Complete :

1. The force of Gravity between two bodies depends on ……………………,………………..
2. The group of small inner planets in solar system are ……………………..,
……………..,……………,………………
3. The group of big outer planets in solar system are ………., ………., …………., ……….
4. Galaxy is …………………………….
5. Light year is ………………………………………
6 . Solar system are formed of
………………..,…………..,…………….,……….,……….,……….
7. The largest planet in size is ……………….and in density is ………………
8. The nearest planet to the sun is …………..and the farthest is ……………..

2- Compare between

a. Universe and galaxy
……………………………………………………………………………………
……………………………………………………………………………………

b. Meteorites and comets
……………………………………………………………………………………
……………………………………………………………………………………

3- Give reason for :

1. The gravity on earth's surface is more than that on Mars .

……………………………………………………………………………………
……………………………………………………………………………………





2. The density of outer planets is small .

....
....

3. Usage of telescopes .

....
....

4. The density of inner planets is large .

....
....

4-Write the scientific term :

1. Solidified masses of ice and gases and pieces of rocks revalue around sun . [.........................]
2. A star system consists of million of stars. [.........................]
3. Celestial small bodies that under the force of gravity between planets [.........................]
4. A device used to see celestial bodies . [.........................]
5. planets which have around them a large number of moons . [.........................]
6-The region that separates between inner and outer planets. [.........................]

5-Choose the right answer :

1. The planets revolve around the sun in orbits .
   a- circular b- elliptical c- spiral d- irregular
2. Which of the following planets has bigger gravity on its surface .
   a- Earth b- Venus c- Mars d- Pluto
3. The solar system consists beside the sun
   a- 8 planets only b- Asteroids and comets and Meteorites only
   c- 3 planets and stars d- 8 planets beside Asteroids and comets and Meteorites
4. There are devices to see celestial bodies ....
   a- Microscopes b- telescopes c- magnifying lens d- convex lens



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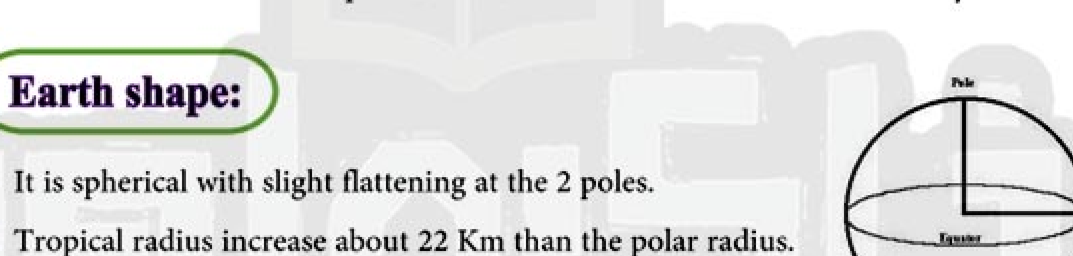

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Lesson 2 **The Earth**

Earth location in solar system:

- Earth is the planet we live on
- It is one of eight planets in the solar system revolving around the sun by the effect of gravity
- Earth locates in third position from sun.
- The distance between Earth and sun is 150 million Km
- The Earth revolves a complete rotation around the sun within 365.25 days.



Earth shape:

- It is spherical with slight flattening at the 2 poles.
- Tropical radius increase about 22 Km than the polar radius.

Earth volume:

- It occupies the fourth order regarding volume (medium position)
- Average radius 6368 Km

Earth mass:

It has the biggest mass in the inner planets (5.9×10^{24} Kilogram).

Characteristics of Earth supporting continuity of life :

1) The atmosphere
2) The hydrosphere (water)
3) Suitable temperature
4) Suitable atmospheric pressure
5) Gravity







1)The atmosphere:

- Earth is surrounded by atmosphere, which appears like white clouds around the earth.
- The atmosphere consists of group of gases, which are:
  a) Nitrogen 78% ,(most abundant gas)
  b) Oxygen 21%
  c) Carbon dioxide 0.03%
  d) Water vapor (variable percentage)
  e) Other gases (very little percent).

Importance of atmosphere:

1. It consists of important gases, which are:
   a) Oxygen: Important for respiration of all living organisms and for burning process.
   b) Carbon dioxide: used by green plant for photosynthesis process to make food for all living organisms
   c) Nitrogen: Used by plants to form protein and decreases the burning effect of oxygen gas
2. Great extension of atmosphere helps in:
   a) Burning small meteors before reaching the earth
   b) Reduces the speed of large meteorites and burns part of it before hitting the earth
3. Weather and climate phenomena take place in atmosphere (wind motion, cloud formation, and rain falling).
4. Help in keeping the earth's temperature suitable for life.
5. Contains ozone layer which protects living organisms from harmful ultraviolet rays of the sun.

2)Hydrosphere:

- The blue color represents the water bodies (71%) like oceans, seas and lakes while the green color represents the land water (29%)
- Water is divided into:
  a) Salt water in oceans and seas and it represents 97%
  b) Fresh water in rivers, lakes and snow at the 2 poles, it represents 3%
  c) Ground water which exists in pores and cracks of rocks



Importance of water for living organisms:

Water is important for all living organisms

a) Plants need water for photosynthesis process to make its food.

b) Man needs water:

- to complete digestion and absorption of food
- For blood formation.
- To keep the body temperature constant.

c) Regulate the earth's temperature during day and night.

d) Suitable environment for most living organisms.

1)Suitable temperature:

Because the earth is in third order from the sun, the temperature is suitable for continuity of life at day and night.

1)Suitable atmospheric pressure:

The atmospheric pressure on earth is 76 cm Hg, which suits continuity of life

1)The gravity:

The earth's gravity is responsible for:

a) Steadfastness of objects and living organisms

b) Steadfastness of hydrosphere.

c) Keeping the atmosphere around the earth.

Inner structure of earth

- Inner part of earth was molten due to high temperature
- The metals with high densities like iron and nickel moved towards the earth's center while metals of low densities arte ascended upwards.
- This lead to formation of earth's layers, which are:

1) **Crust**: Light outer layer (8 – 60 km)
2) **Mantle**: Rocky layer (about 2885 km)
3) **Core**: it is divided into:
   a) **Outer core**: consists of molten materials (about 2100 km)
   b) **Inner core**: slid layer rich in iron and nickel (about 1350 km)

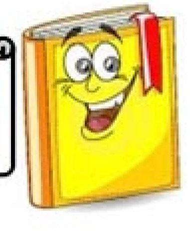












Evaluation

1-Complete

1. Earth is ………………………………………………….
2. The position of the earth from the sun in the solar system is ……………….
3. Mass of the Earth is ……………………………………………
4. The size of the earth is …………………………………………
5. The components of earth's atmosphere are ……….,………..,………,………,………
6. The importance of Atmospheric air of earth is ……..……,…………..,…………
7. The importance of water for living organisms is …..…,………,………..,…………..
8. The Atmospheric pressure on earth is …………….……cm Hg .
9. The structure of earth consists of ……………..., ………………., ……….……
10. The inner core of earth consists of ……….………and…………………………..
11. The outer core of earth consists of ………………………………………………
12. The earth crust is …………………………………………………………..………..
13. The mantle is ………………………………………………………………………

2-What is the importance of



a. oxygen gas

…………………………………………………………………………………………

…………………………………………………………………………………………

b. carbon dioxide gas

…………………………………………………………………………………………

…………………………………………………………………………………………

3-Give reason for:

1. Burning small comets before reaching earth .

…………………………………………………………………………………………

…………………………………………………………………………………………



2. Protection of living organisms on earth from harmful ultraviolet rays of sun .

....

....

3. The Atmospheric pressure on earth is 76 cm Hg .

....

....

4. Steadfastness of hydrosphere on earth's surface .

....

....

4-Write the scientific term :

1.It equals 76 cm Hg . [.........................]

2. Third rank far from sun. [.........................]

3. rich in nickel and iron. [.........................]

4. A gas used in photosynthesis process. [.........................]

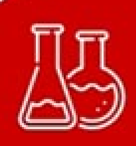
5-The most abundant gas in air. [.........................]

6-The layer of atmosphere which protects the earth and living organisms from the harmful ultraviolet radiations. [.........................]

7-The layer of the earth just beneath the earth's crust and its thickness about 2885kms. [.........................]

8-The layer of the earth which is rich in iron and nickel. [.........................]







Date: ___________



Lesson 3 Rocks and Minerals

Soil:

Thin superficial layer that covers the earth's crust

Rocks:

Natural solid material in the earth's crust consists of one mineral or group of minerals.

Rocks can be classified according to their way of formation into:

1) Igneous rock
2) Sedimentary rocks.
3) Metamorphic rocks.

1)Igneous rocks:

Formed from molten material (extremely hot viscous liquid) which can be:

a) **Magma**: molten material which exists underneath the earth's crust.

b) **Lava:** extruded magma in the form of volcanic flow

Magma forms plutonic rocks, while lava forms volcanic (surface) rocks.

Plutonic rocks	Volcanic rocks
1) Formed inside the earth's crust from magma 2) Have coarse (rough) texture with large sized crystals 3) **Example:** Granite (consists of 3 minerals; quartz, feldspar and mica)	1) Formed on earth's surface from lava (volcanic flow) 2) Rocks contain small holes (from volcanic gases),and the crystals are small sized 3) **Example:** Basalt (consists of olivine, Pyroxene and feldspar)





G.R.F

Plutonic rocks have large sized crystals.

- Because magma gets cool slowly and minerals take longer time to crystallize.

Volcanic rocks have small sized crystals.

- Because lava gets cool quickly and crystallization happens quickly.

1)Sedimentary rocks:

- Represents 5% of the total volume of rocks and wrap about 75% of the earth's surface.
- **Steps of formation of sedimentary rocks:**
  a) Fragmentation of any rocks (igneous, sedimentary or metamorphic).
  b) Deposition in watery medium.
  c) Adhering of the deposited particles.



Sandstone (yellow) and limestone (white).

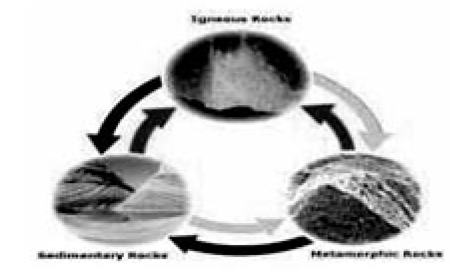
- Sedimentary rocks appear as layers above each other, where older layers are at the bottom and the ones above are the most recent.
- Limestone is formed from participation of calcium carbonate in lime solutions, so it consists of mineral calcite.
- **How to differentiate between sandstone and limestone?**
  By using hydrochloric acid, where limestone produces effervescent due to evolving of carbon dioxide.

1)Metamorphic rocks:

- Formed from old rocks (igneous or sedimentary) exposed to high pressure and high temperature.



marble.











Date: ...\...\...

Evaluation



1-Complete

1. Igneous rocks are the rocks that formed from ……………………….
2. Sedimentary rocks are the rocks that formed from …………………
3. Metamorphic rocks are the rocks that formed from ………………..
4. …………………., ………………are Igneous rocks
5. ………………….,……………….are Sedimentary rocks .
6. ……………………is Metamorphic rock
7. Igneous rock are divided into ………………rocks and ………………..rocks .

8-Sandstone consists of……………….,…………………and……..minerals.

2-Which of these rocks are sedimentary and which are Igneous.

Marble – Granite – Lime stone – sandstone – Basalt .

……………………………………………………………………………………………

……………………………………………………………………………………………

3-Compare between Igneous, sedimentary & Metamorphic rocks from the point of formation , example.

Igneous	Sedimentary	Metamorphic



4-Write the scientific term :

1-Rocks are formed by solidification of magma under the earth's crust. [………………..]

2-The magma when it reaches the earth's surface. [………………..]

3-Rocks that are formed when igneous or sedimentary rocks are subjected to high temperature and pressure. [………………..]

4-Molten material that exists at depths beneath the crust. [………………..]

5-A rock formed from quick cooling of lava on the surface of the earth's crust. [……………..…]

3-Give reason for:

1-The crystals of minerals that form the plutonic rocks are large –sized.

………………………………………………………………………………………………

………………………………………………………………………………………………

2-The components of granite rock can be seen by naked eye.

………………………………………………………………………………………………

………………………………………………………………………………………………

3-Limestone consists of mineral calcite.

………………………………………………………………………………………………

………………………………………………………………………………………………







Final revision

Complete the following:

1- All metals are ………………except…………which is liquid.

2-…………….element is good conductor of heat and electricity.

3-A nitrogen atom contains …………….electrons,while nitrogen ion contains ………electrons.

4-The chemical formula of hydrochloric acid is………………………….

5-sodium salphide is from the salts that ……….in water ,while lead sulphate is from the salts that ………………..in water.

6-compounds are classified according to their properties into……………,bases,………… and………………………………

7-$2NO_2 + O_2 \longrightarrow$ ……………………..

8-The chemical reaction is the…………….of the existing bond between the atoms of bond in reactant and………………… of new bond between the atoms of molecules of products .

9-……………….,…………………and…………..are among the products of fuel burning.

10-…………………….+…………………… $\longrightarrow$ NH_4CL

11-C +O2 $\longrightarrow$ ……………………

12-Chemical reaction used in many industries as………….,……….and………..

13-The weight of the object is measured by ………………unit.

14-the work done to lift an object ……………….by increasing object's mass.

15-…………………forces are resistant forces originated between a moving object and the medium touching it.

16-The force of gravity between two objects depends on ………….. and ………………

17-The biggest planet in volume is …………… , while the highest one in density is the ……………….

18- The nearest planet to the sun is ……… where the farthest one from the sun is ………

19- Ground water exists in the ……… of rock that forming the earth's mass

20-Green plants use ……. Gas in photosynthesis process. While ………… gas is used by green plants to make protein .

21- Sedimentary rocks forming a thin cover that wraps about ……… of the earth's surface although they represent ………….. of the total volume of the earth's crust rocks .



22- Molten material that exists beneath ……….. which is extremely hot and thick, known as …………… and after going out on the earth's surface in the form of ………… Is called ……….. .

23- marbel is resulted from ……………. Transformation .

24- the types of telescopes are ………. and ………….

25- Sedimentary rocks are formed as a result of …………, ………….. and ……….

26- Earth consists of a number of arranged layers from the surface to the center : the crust , ……… and ……………. .

27- The ………… layer in the atmospheric air protects living organism from the harmful rays .

28- Granite if from ………. Rocks , but lime stone is from ………….. rocks.

29- Granite consists of ……. , ……… and ……….. minerals , while basalt consists of ……… , ………….. and ……………. .

30- The planet earth occupies the ……………. Position in the solar system in view of volume regarding the density it occupies …………. .

Choose the correct answer:

1-In a negative ion the no of proton is……………..than electrons.
a)more b)less c)equal

2-All this elements can share in chemical reaction except………….
a)Neon b)Hydrogen c)Nitrogen

3-When an atom loses, gains or share by one electron its valency is……………….
a)monovalent b)divalent c)trivalent

4- planets revolve around the sun in ………… Paths
a)circular b) elliptical c) spiral

5- which of the following planets has the largest gravity on its surface
a)earth b) mars d)venus

6- regarding to volume, earth occupies the ……….. order in the solar system .
a) fifth b)fourth c) third

7- water masses on earth's surface form about ……..
a)30% b) 50% c)71 %

8- Car brakes is from applications of …………
a)friction force b)gravity force c) inertia)

9- All of the following are periodic motion except ……………
a)fan b) pendulum c)train









10- All the following are accompanied forces to motion except ……………

a)centrifugal force b)friction force c)gravitational force d)inertia

11- electromagnets is used in making …………….

a)calculator b) electric bell c)microscope d) night vision

12- The idea of machine lubrication depends on lessening of ………………

a) weight b) inertia c) friction force d) gravity.

13 – In periodic motion ………….

a) the pathway is straight b) motion regularly repeated c) time regularly repeated – speed regularly repeated)

14- ………………. Wave is an example of mechanical waves

a)sound b) light c) radio d) ultraviolet

15- The motion of simple pendulum represents ……………..

a)vibrating motion b)circular motion c)wave motion

16- device used to change mechanical energy to electrical energy …………….

a)motor b)dynamo c)electromagnet c)all the previous.

17- The measuring unit of force is ……………

a) kilogram b) joule c) newton

18- …………… rays have medical purpose

a)infrared b)gamma c)light

19-the valency of copper in Cu_2O is…………………

a)monovalent b)Divalent c)trivalent d)tetravalent.

20-…………………..is the smallest Earth's layer in thickness.

a)crust b)inner core c)mantle d)outer core.

Write the scientific term:

1-it is an effect attempts to change the motion direction of an object

(……………………………….)

2- rays used in photographic bones for detecting bone fracture

(……………………………….)

3-the force of earth's gravity on the object.

(……………………………….)

4-an instrument used to change mechanical energy into electric energy

(……………………………….)

6-it is a motion which is regularly repeated in equal period of time .5-

(……………………………….)

7-the ability of earth to attract an object to its center (..................................)

8-waves that don't need a medium to travel. (..................................)

9- an object's position changes with the time passes from its initial position to a different final one (..................................)

10- the force that accompanies the massive amount of energy and it is stored in the nucleus (..................................)

11- resistant force originates between moving object and medium touching it (..................................)

12- an instrument used to change electric energy to mechanical energy (..................................)

13- waves that need medium to travel (..................................)

14- it is the tendency of an object to keep its state (static or motion) (..................................)

15- the displacement covered by an object in a unit time. (..................................)

16- forces used to get radioactive elements used in medicine (..................................)

17- forces prevent feet from slipping on roads during walking (..................................)

Name each of the following:

1- $Cu(NO_3)_2$	2- HNO_3	3- $NaOH$
4- NH_4NO_3	5- $CaHCO_3$	6- H_3PO_4

Identify the type of each one of the following into (Neutral atom , inert gas , positive or negative ion)

8 + (2, 8)

15 + (2, 8, 5)

10 + (2, 8)

13 + (2, 8)



What will happen if:

1- A moving bus stops suddenly

……………………………………………………………………………………..

2- mechanical machines are not lubricated

…………………………………………………………………………………….

3- Electric current flows through an isolated copper wire coiled spirally around a plastic tube containing iron bar and approach it to iron filings (give reason)

……………………………………………………………………………………

4- you hit quickly a paper placed over a glass cup and a coin was placed over the paper .

…………………………………………………………………………………….

5- you ride a bike a long a flat road, then use brakes.

…………………………………………………………………………………

6-magnesium strip burns in the presence of air.

…………………………………………………………………………………..

7-a glass rod wet with ammonia solution is exposed to a test tube of hydrochloric acid .

…………………………………………………………………………………

What is meant by

1- Transitional motion

…………………………………………………………………………………..

2- object's weight

…………………………………………………………………………………..

3- a moving body covers equal displacements in equal intervals of time

…………………………………………………………………………………..

4- periodic motion

…………………………………………………………………………………..

5- force

…………………………………………………………………………………..

6- inertia:

………………………………………………………………………………………

7-low of constant ratio:

………………………………………………………………………………………





8-chemical reaction:

....

9-chemical equation:

....

Problems:

1-If the earth's gravity in a place is 9.8 m/s^2, find the body weight of mass 50 Kg.

....

....

2-Find the weight of an object if you know that its mass is 100Kg and earth's gravity acceleration 9.8 m/s^2

....

....

3-find the mass of body its weight 98 N and earth's gravity acceleration 9.8 m/s^2

....

....

4-calculate the mass of reactant and product through the following reaction:

$HCl + NaOH \longrightarrow NaCl + H_2O$ (H=1 , O=16 ,Cl=35.5 ,Na=23)..

....

Write the chemical equation that represent

1-heating magnesium in air.

....

2-reaction of ammonia gas and hydrochloric acid.

....

Give reasons for:

1-An effervescence takes place when hydrochloric acid is added to a sample of lime stone .

....

2-Astronauts can't hear each other voices directly in space .

....

3-Astronrmers don't measure the distance between stars with kilometers

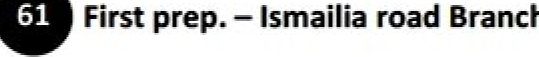
....

4-Presence of life on the surface of earth's planet only

....

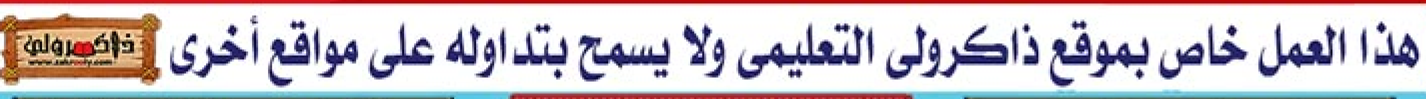
5-Earth gravity helps in continuity of life .

....











6-The crystals of the minerals forming the plutonic igneous rocks are large in size

....

7-Volcanic rocks contain small circular holes.

....

8-Temperature on earth's surface suits the life of living organisms.

....

9-Earth's inner core is rich in iron and nickel.

....

10-Stead fastness of hydrosphere on earth's surface.

....

11-The density of auto planets is low.

....

12-The gravity on earth's surface is larger than on mars surface .

....

13-We see lightening before hearing thunder.

....

14-We must use the safety belt in cars and planes.

....

15-Gravity acceleration changes from one place to another on earth's surface.

....

16-It is more favorable wireless connection than amplifiers when two people are telecommunicating.

....

17-Electric fan still working for few seconds after cutting the electric current.

....

18-When the car stops suddenly , passengers are rushed forward.

....

19-Car tires are covered with a very coarse substance.

....

20-Car passengers rush backward when the car moves suddenly.

....

21-Sound and water waves are mechanical waves.

....

22-Astronauts can't hear each other voices directly in the space.

....





23-Lubricating and oiling mechanical machines.

…………………………………………………………………………………………………

24-We can see lightning before hearing the thunder.

…………………………………………………………………………………………………

Mid – Term Exam

Question [1] A) Correct the underlined word:

1- During the chemical reaction, the total amount of reactants masses is **smaller than** the total amount of products masses .

2- **Non – metals** don't participate in any chemical reactions due to the completeness of their outer electron shells.

3- The valency of the element X in the compound XO is **trivalent**.

4- **Atomic group** is breaking down of the bonds between reactants atoms and forming new bonds between atoms in the products molecules.

B) Write the chemical formula of :

1- Sodium carbonate 2- Hydrochloric acid.

C) Find the mass of a body of weight 450 N knowing that the gravitational acceleration = 10 m/sec^2 .

Question [2] A) Choose the correct answer :

1- ……………is used in medicine, industry and scientific researches .

a) Attraction for b) Strong nuclear force c) Weak nuclear force

2- So$_3$ is the chemical formula of …………… .

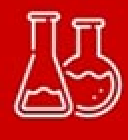
a) sulpher trioxide b) sulpher dioxide c) sulphate

3- The reaction: $NH_3 + HCl \longrightarrow NH_4Cl$ represents a reaction between …………. .

a) an element with a compound . b) an element with an element .

c) a compound with a compound .





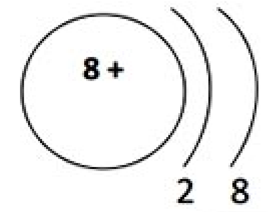


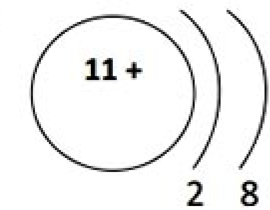


4- The number of atoms in calcium nitrate $Ca(NO_3)_2$ is …………atoms.

a) 7 b) 8 c) 9

B) Identify each of the following (if it is : positive ion negative ion or neutral atom :

1- 

2- 

C) Complete the equation : (Should be balanced)

1) $2\,CO + O_2 \longrightarrow$ ………..

Question [3] A) Complete the following statements:

1- …………………is an example of base while ……………is an example of salt.
2- Forces are divided into 3 main types which are ………….., attraction force and ………… .
3- The bond that occurs between the atom $_{12}X$ and the atom $_{8}Y$ is …………bond while that occurs between two atoms of $_{8}Y$ is …………bond.
4- Nitrogen oxides are acidic gases that affect …………..system and …………. .

B) **Give reason for**

1- The change of the weight of the body from a place to another on the Earth while the mass of the body is constant.

Question [4] A)Write the scientific term :

1- A device that converts the mechanical energy into electric energy.
2- A set of chemical formula and symbols expressing the reactants and the products and the reaction conditions .
3- It is the number of electrons gained , lost or shared by the atom during chemical reaction.

B) Compere between the following elements :

$_{16}S$, $_{13}Al$

According to :





1- Electron configuration .
2- Type of each atom : [metal , non – metal or noble]

Final Test (1)

1st Question : A) Complete the following statements:

1- ………………. force helps to stop and start the car's motion .

2- The force of gravity between any two objects in the space depends on their masses and …………………. between them .

3- Types of motion are ………………motion and ………………..motion .

4-……….……. and ……………….. oxides are acidic gases .

B) What happens in the following cases:

1- When an electric current passes through an isolated copper wire coiling around a bar of soft iron .

2- There is no atmosphere .

2nd Question : A) Choose the correct answer:

1- ……………….. are used in remote sets and night vision apparatus.
a) Ultraviolet rays b) X-rays c) Gamma rays d) Infrared rays

2- The metamorphic rocks are produced as a result of the effect of high heat and pressure on ….
a) igneous rocks only b) sedimentary rocks only
c) plutonic rocks only d) a and b

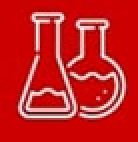
3- Which of the following is considered as a circular motion ? ……………..
a) fan motion b) pendulum motion
c) train motion d) water waves motion

4- ……………….. is formed on the earth's crust from lava .
a) Sandstone b) Limestone c) Basalt d) a and b are correct

5- In the reaction $2NO + O_2 \longrightarrow$ ………….., the product will be.
a) $2NO_2$ b) $2\ NO_3$ c) 2NO d) N_3O_4

6- …………….. has the biggest mass in the inner planets .







a) The sun b) The earth c) Jupiter d) Mercury

B) If the weight of a body is 320 Newton , Calculate the mass of the body

[knowing that the gravitational acceleration = 10 m/sec^2]

C) Give reason for:

1- Inner core of the Earth is rich in iron and nickel .

2- Policemen advice drivers to use safety belts in cars .

3rd Question : A) Put (√) or (×):

1- Venus is from the gaseous planets that mainly consist of gases . ( )

2- Oil and lubricants are used to decrease the friction force in the mechanical machines.( )

3- The mantle layer consists of molten metals . ( )

4- The number of reactant atoms of an element should be equal to the number of its atoms produced from the reaction . ( )

5- The atmospheric pressure on the Earth is 76 Cm.Hg. ( )

B) What is the importance of the following:

1- Strong nuclear force 2- Telescope

C) Compare between:

1- Mechanical & Electromagnetic waves. **[according to : speed – example]**

4th Question : A) Correct the underlined words:

1- The distance between stars is measured with **meters** .

2- The dynamo converts the **heat** energy into electric energy .

B) Write the scientific term:

1- A property of the object to resist the change of its phase from rest to motion in a regular speed and in a straight line unless an external force acted upon it.







2- It is a set of symbols and chemical formula that represents the molecules of reactants and products and the conditions of the reaction .

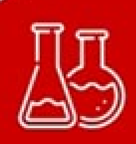
3- Its the distance at which an object moves away from its original position at any moment.

C) Match from column (B) what is suitable for column (A):

(A)	(B)
1- Galaxy	a- it consists of head and tail .
2- The comet	b- it separates between inner and outer planets .
3- Meteor	c- the biggest unit at the universe
4- Asteroid belt	d- it is a small rocky mass that burns completely at the atmosphere .

Good Luck







Final Test (2)

Question [1] A) Choose the correct answer :

1- The inner core of the Earth is rich in iron and ....

a) copper b) aluminum c) nickel

2- As the distance from the Earth's center decreases , the weight ....

a) decreases b) increases c) doesn't change

3- The motion of a fan arm is an example of a .... motion .

a) circular b) vibrating c) wave

4- The planets revolve around the sun in .... orbits.

a) circular b) spiral c) elliptical

5- .... acts as a green house because it allows the thermal rays of the sun to pass and never let them to return back.

a) Carbon dioxide b) Nitrogen oxide c) Sulpher dioxide

B) Give one importance for :

1- Infrared rays 2- Atmosphere 3- X-rays

C) What happens if :

1- There is no ozone layer.

2- The sedimentary or igneous rocks are exposed for a great pressure and high temperature.

Question [2] A) Put (√) or (×) in front of the following statements:

1- The nuclear energy can be used to produce electric energy. ( )

2- Sedimentary rocks are divided into plutonic rocks and volcanic rocks. ( )



3- Contraction and relaxation of muscles help the body organs to move. ( )

4- The chemical equation is a set of symbols and chemical formula that represents reactants only. ( )

B) **Compare between : (two points of comparison only)**

1- Inner and outer planets.

2- Mechanical and electromagnetic waves.

C) Calculate the mass of an object , its weight = 300 Newton

(Knowing that the gravitational acceleration = 10 m/sec^2)

Question [3] A)Write the scientific term :

1- Breaking of bonds in reactants molecules and forming new bonds in products molecules.

2- The distance that covered by the light in one year.

3- The planet of the biggest mass in the inner planets of the solar system.

4- Rabid and successive shaking of the ground take place one after the other.

5- A property of an object to resist the change of its phase from rest to motion in a regular speed and in a straight line unless an external force acted on it .

B) Match from column (B) what is suitable for column (A) :

(A)	(B)
1- Magma	a- fracture in Earth's crust causes sliding of rocks.
2- Fault	b- consists of head and tail
3- The comet	c- molten material which exists underneath the Earth's crust







C) Complete the following equations : (Balance it if it needs)

1) $HCl + NH_3 \longrightarrow$ ……………..

2) $2CO + O_2 \xrightarrow{\Delta}$ ……………..

Question [4] A) Complete the following :

1- The main types of motion are …………….. motion and ………….. motion.

2- …..………….. and ………………. are from the harms of friction.

3- The idea of electric generator is changing ………….. energy into ………….. energy.

4- The Earth consists of a number of arranged layers from the surface to the center which are ………………….. , ………………… and core.

5- Parts of volcano are volcanic vent , …………….. and ………………

6- ……............ and ………………. are from the characteristics of the Earth supporting the continuity of life.

B) Give reason for :

1- The car passengers are rushed forward when the car stopped suddenly.

2- Meteors burn before reaching the Earth's surface.

C) Correct the underlined words :

1- The measuring unit of earthquake is **Cm.Hg**.

2- **Microscope** is used to identify the celestial bodies.



Good Luck